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# *Erythroxylum ayrtonianum* (Erythroxylaceae): A New Species from Brazil

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**ABSTRACT.** A new species assigned to *Erythroxylum* sect. *Rhabdophyllum* O. E. Schulz is described and illustrated under the name of *E. ayrtonianum* Loiola & M. F. Sales. This new species resembles *E. pelleterianum* A. St.-Hil. in the general aspect of its leaves and the flexuous, slender branches, but differs by its distichous cataphylls distributed along the short branches and the leaves with wavy to strongly wavy margins. *Erythroxylum ayrtonianum* is reported from savanna formations (cerrado vegetation) in the north-central portion of Brazil, with the type locality from the state of Tocantins.

**Key words:** Brazil, Erythroxylaceae, *Erythroxylum*, IUCN Red List, savanna formations.

South America is one of the main centers of diversity and endemism of *Erythroxylum* P. Browne (Erythroxylaceae), where 114 (64.9% endemic) and 34 (11.8% endemic) species are found in Brazil and Venezuela, respectively (Plowman & Hensold, 2004; Loiola, 2011). According to Loiola (2001, 2011) and Loiola et al. (2007), the *Erythroxylum* species in Brazil are found in humid forests, such as the Amazon and Atlantic communities, as well as drier vegetation types such as semi-arid scrub forest (caatinga) and savanna formations (cerrado). Northeastern Brazil boasts the greatest diversity and the largest number of taxa endemic to the country, with several new species described recently (Plowman, 1983, 1986, 1987; Loiola & Sales, 2008).

During taxonomic analysis of herbarium materials for the monograph of *Erythroxylum* sect. *Rhabdophyllum* O. E. Schulz for *Flora Neotropica*, a new species was discovered from the cerrado of Tocantinópolis and Ilha do Bananal (both in Tocantins) and Imperatriz (Maranhão, Brazil). The new taxon is described and illustrated here.

***Erythroxylum ayrtonianum*** Loiola & M. F. Sales, sp. nov. TYPE: Brazil. Tocantins: Tocantinópolis, Ribeirão do Córrego, 55 km SW of Estreito along Belém–Brasília hwy. (BR 153), 6°49'S,

47°49'W, 27 Feb. 1980 (lf.), T. Plowman, G. Davidse, N. A. Rosa, C. S. Rosário & M. R. dos Santos 9210 (holotype, F; isotypes, MO not seen, NY). Figure 1.

Haec species foliorum laminis ellipticis et ramulis flexuosis tenuibus *Erythroxylum pelleteriano* A. St.-Hil. affinis, sed ab eo foliis membranaceis (vs. chartaceis) marginibus undulatis (vs. planis), cataphyllis ramorum brevium congestis (vs. paucis) distichis, stipulis 2–3 mm (vs. 3–4 mm) longis et pedicellis ca. 2.5 mm (vs. 4–10 mm) longis differt.

Shrubs or small trees 0.8–8 m, with open, spreading crown and storied branches; lenticels absent; bark thin, reddish brown, longitudinally fissured or exfoliating in thin flakes; branches light gray; branchlets slender, 1–2 mm diam., arranged alternately, diverging 45° or 90° from axis, finely striate, terete, flexuous, light brown and flattened; new twigs mustard yellow or reddish brown; numerous short branches; internodes 10–45 mm long. Cataphylls congested and present along short shoots and produced at base of new shoots for 7–15 mm, distichous, persistent, similar to stipules, yellowish when young, brown when older; spinule 0.5–1.5 mm, darkened, pointed; stipules 2–3 × 1.2–1.8 mm, triangular, rounded at apex, clearly striate-nerved, with 5 or 6 parallel nerves per side, margin markedly erose when young, entire when mature, the setae lacking or rarely with 3, the 2 lateral setae ca. 0.7 mm, the medial seta ca. 1 mm; keel prominent, riblike; petiole 1–4.5 × 0.4–0.6 mm, subterete, sulcate adaxially; leaf blades 2.4–6.6 × 1.3–3 cm, membranous, sometimes deciduous, elliptic, acute at apex, acute at base, margin undulate or strongly undulate, slightly discolored, somewhat shiny, medium green, dull adaxially, glaucous dull pale green abaxially, the midrib obscure adaxially, prominent abaxially, with 9 to 11 secondary nerves on each side, the veinlets very finely reticulate, most evident on lower leaf surface. Inflorescences as fascicles reduced to one flower, in

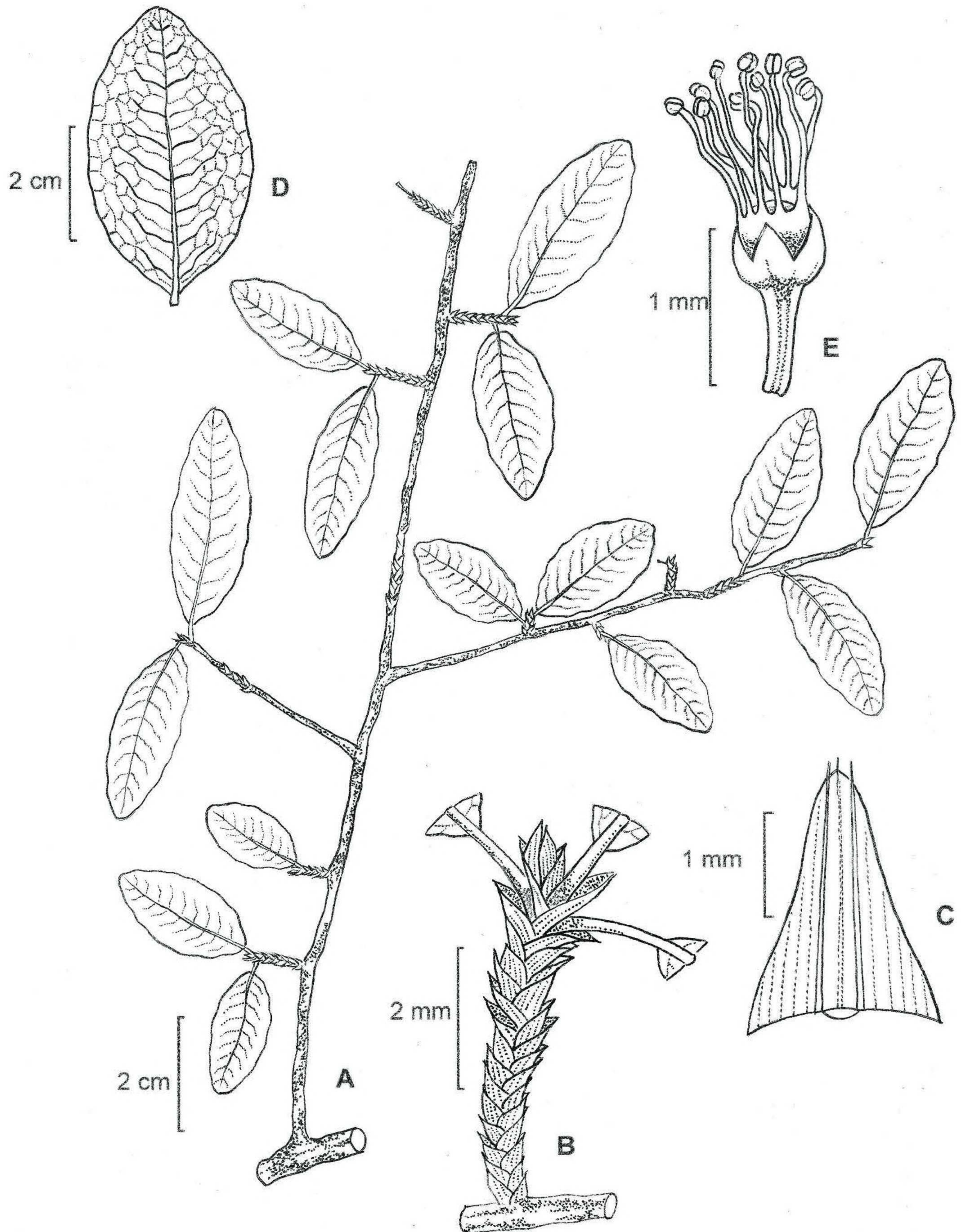


Figure 1. *Erythroxyllum ayrtonianum* Loiola & M. F. Sales. —A. General view of a branch. —B. Detail of branch showing cataphylls and stipules. —C. Stipule, showing three apical setae. —D. Detail of the leaf, adaxial surface. —E. Brachystylous flower, showing the stamen tube. A–D drawn from the holotype *Plowman et al.* 9210 (F); E from *J. A. Ratter et al.* 4414 (F).

axils of cataphylls; bracteoles not seen; buds not seen. Flowers with pedicel ca. 2.5 mm, 5-angled, greenish white; calyx 2–2.2 × 2.2–3 mm; lobes 1–1.2 × 0.5–0.6 mm, triangular; petals not seen; staminal cup 0.7–0.8 × 1–1.2 mm, smaller than

calyx, margin entire; brachystylous flowers with filaments 2.2–2.8 mm; anthers 0.4 × 0.3 mm, oblong to cordiform; styles not seen; ovary ca. 0.8 × 0.7 mm, ellipsoid. Dolichostylous flowers not seen. Drupe not seen.

*Distribution, habitat, and ecology.* The new species has a narrow geographic range, between 6°S and 10°S latitude and 47°W and 50°W longitude. *Erythroxyllum ayrtonianum* occurs in the cerrado in Tocantins and Maranhão states, in north-central Brazil, at elevations between 290 and 480 m. In Tocantinópolis (Tocantins), it was found in a low gallery forest along a stream, in an area of sandstone rocks and sandy soils. Some populations of this species occur in protected areas in Bananal Island, localized within a conservation area, the Araguaia National Park in the state of Tocantins.

*IUCN Red List category.* *Erythroxyllum ayrtonianum* should be considered Least Concern (LC), according to IUCN Red List criteria (IUCN, 2001).

*Phenology.* The new species was collected in flower (mature) in September.

*Etymology.* The specific epithet *ayrtonianum* honors Ayrton Amaral Jr. of the Universidade Estadual de São Paulo, Campus Botucatu, São Paulo, Brazil, specialist in the systematics of *Erythroxyllum*.

*Discussion.* *Erythroxyllum ayrtonianum* is included in *Erythroxyllum* sect. *Rhabdophyllum* because of its striate-veined stipules and triangular calyx lobes. The taxon is very similar to two other species of this section (*E. pelleterianum* A. St.-Hil. and *E. buxus* Peyr) in the overall aspect of the leaves and with respect to geographic distribution in that the three species are found in cerrado. However, these taxa can be separated by the combination of markings observed on their leaves, stipules, and flowers.

*Erythroxyllum ayrtonianum* shares with *E. pelleterianum* elliptic leaves and the flexuous, slender branches. However, the new taxon differs from the former by the leaf being membranous when mature (vs. chartaceous when mature), stipule length (2–3 mm vs. 3–4 mm), number of setae on stipules (three or none vs. three), number of secondary nerves on each side of leaf (nine to 11, most evident on lower leaf surface vs. 11 to 16, evident on both sides of the leaf) and pedicel lengths (ca. 2.5 mm vs. 4–10 mm).

*Erythroxyllum ayrtonianum* is similar to *E. buxus* in the membranous leaf texture. The latter differs by its leaf form (elliptic vs. obovate), by the number of striations on stipules and cataphylls (five or six vs. six to nine nerves), and by pedicel length (ca. 2.5 mm vs. 8–15[20] mm). Uniquely distinctive characteristics for *E. ayrtonianum* are the distichous cataphylls

present along the length of the short branches and/or at the base of new branchlets, as well as the leaves with wavy to strongly wavy margins.

*Paratypes.* BRAZIL. **Maranhão:** Imperatriz, “Bananal,” 15 km S of Imperatriz along Belém–Brasília hwy. (BR 010), ca. 5°40’S, 47°26’W, 29 Feb. 1980 (lf.), T. Plowman, G. Davidse, N. A. Rosa, C. S. Rosário & M. R. dos Santos 9348 (INPA, MG, MO not seen, NY). **Tocantins:** Ilha do Bananal, Parque Nac. Araguaia (IBDF), near HQ (ca. 2 km from Macaúba, ca. 10°30’S, 50°30’W, 15 Sep. 1980 (lf., fl.), J. A. Ratter, M. P. Rocha & R. A. de Castro 4414 (F); Tocantinópolis, Ribeirão do Córrego, 55 km SW of Estreito along Belém–Brasília hwy. (BR 153), 6°49’S, 47°49’W, 27 Feb. 1980 (lf.), T. Plowman, G. Davidse, N. A. Rosa, C. S. Rosário & M. R. dos Santos 9206 (NY), 9207 (F, MO not seen, NY), 9208 (F, FLAS, GH, MICH, MO not seen, NY, UC, WIS), Plowman et al. 9215 (MO not seen, NY).

*Acknowledgments.* The authors thank the curators of the following herbaria, who kindly sent material on loan: F, INPA, MG, and NY. Thanks are due to Maria de Fátima Agra of the Universidade Federal da Paraíba, Brazil, for her revision of the Latin diagnosis and to Bianca Araújo Primo for the illustrations of the new species.

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